

REMARKS

In the Office Action mailed October 27, 2010 (the "Office Action"), the Office rejected claims 1-2, 9-11, 13-14, 16, 18, 21-26, and 28-30 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,738,437 to Ma et al. ("Ma"); rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Ma in view of U.S. Patent Application Publication No. 2006/0245409 to Korpela ("Korpela"); rejected claims 15 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Ma in view of U.S. Patent Application Publication No. 2005/0243774 to Choi ("Choi"); and rejected claims 17 and 19-20 under 35 U.S.C. § 103(a) as being unpatentable over Ma in view of U.S. Patent No. 7,567,624 to Schmidl ("Schmidl"). Applicants traverse these rejections. Claims 3-8 were indicated as allowable if rewritten in independent form.

Applicants herein amend claims 1-5, 7-9, and 11 to more clearly identify the subject matter for which applicants seek protection. Claim 10 and 12-30 have been canceled, and claims 31-50 have been added. Claims 1-9, 11, and 31-50 are therefore currently pending.

A. Interview Summary

Applicants' representative Steve Bishop thanks Examiner Sarwar for the in-person interview that was conducted on February 16, 2011. During the interview, applicants' representative and inventor Titus Lo discussed applicants' claimed invention and a number of distinctions between the claimed invention and the Ma and Korpela references, including the transmission of common pilot subcarriers and cell-specific pilot subcarriers within a same frequency band in a synchronized communication network, the use of common pilot subcarriers to mitigate composite channel effects, and the use of cell-specific pilot subcarriers to mitigate cell-specific channel effects. Such distinctions are outlined in greater detail herein. Applicants appreciate the Examiner's suggestions made during the interview, many of which have been incorporated into the amended claims. Applicants' representative respectfully requests that the Examiner

contact the undersigned if he believes that any additional information regarding the interview is necessary.

B. Amendments to the Specification

As recommended by the Examiner, applicants have proposed a more descriptive title for the application. In reviewing the specification, applicants have also identified a few minor typographic errors. Amendments have therefore been made to paragraph [0030] to correct a misspelling and to conform the reference numbers in the text with the blocks depicted in Figure 1. Moreover, an amendment has been made to paragraph [0039] to correct the text and note the proper variable as identified in U.S. Provisional Application No. 60/540,032, to which the present application claims priority. Entry of the amendments to the specification is respectfully requested.

C. § 102(e) and § 103(a) Rejections

As discussed during the interview, applicant's technology uses common pilot subcarriers and cell-specific pilot subcarriers, as well as common data subcarriers and cell-specific data subcarriers, to facilitate the transmission of data within a multi-carrier, multi-cell wireless communication system. As depicted in Figure 5 and described in paragraphs [0036]-[0039] and elsewhere in applicants' specification, a common pilot subcarrier transmitted by one base station is aligned in frequency subcarrier index with common pilot subcarriers transmitted by other base stations in the system. Such alignment is expressly highlighted in independent claim 1 ("wherein the common pilot subcarriers are aligned in frequency subcarrier index with common pilot subcarriers transmitted by other base stations"), and similar limitations pertaining to alignment in frequency subcarrier index are contained in independent claims 31, 41, 49, and 50. As noted in independent claims 1, 31, and 41, the common pilot subcarriers are used to determine composite channel coefficients, compensate for composite channel effects, and recover common data contained on the common data subcarriers. In addition, as

depicted in Figure 5, and described in paragraphs [0034]-[0035] and elsewhere in applicants' specification, at least some of the cell-specific pilot subcarriers transmitted by one base station are not aligned in frequency subcarrier index with cell-specific pilot subcarriers transmitted by other base stations in the system. Such lack of alignment is expressly highlighted in independent claim 1 ("at least some of the cell-specific pilot subcarriers are not aligned in frequency subcarrier index with cell-specific pilot subcarriers transmitted by other base stations"), and similar limitations pertaining to lack of alignment in frequency subcarrier index are contained in independent claims 31, 41, 49, and 50. As noted in independent claims 1, 31, and 41, the cell-specific pilot subcarriers are used to determine cell-specific channel coefficients and compensate for cell-specific channel effects.

Amended claim 1 contains elements of dependent claim 12 which was rejected by the Office under 35 U.S.C. § 103(a) as being unpatentable over Ma in view of Korpela. Applicants will therefore primarily direct their remarks to those references. Claims 15, 17, 19-20, and 27 have been canceled so the rejection of those claims under Choi and Schmidl is not addressed herein.

Contrary to the Office's position, applicants' assert that Ma and Korpela do not teach or suggest the concepts of common pilot subcarriers and cell-specific pilot subcarriers for recovering common data carried on common data subcarriers and cell-specific data carried on cell-specific data subcarriers, nor do they distinguish between the concepts of cell-specific channel coefficients and composite channel coefficients. Among other limitations, the Office argues that Korpela discloses determining complex channel coefficients and determining composite channel coefficients. (See, e.g., Office Action, page 7.) Applicants respectfully disagree with this interpretation. As noted by the Office, Korpela discloses the determination of a complex channel coefficient. (Korpela, ¶ [0014].) The complex channel coefficient is calculated by comparing received common pilot symbols to transmitted pilot symbols. (*Id.*) Although called

"common" pilot symbols, the common pilot symbols in Korpela are different than the common pilot subcarriers of applicants' claimed invention. Korpela discusses "common" pilot symbols in the context of transmission within a single cell, namely the cell depicted in Figure 1. Korpela does not distinguish between cell-specific channel effects and composite channel effects, nor does Korpela describe how to recover data in light of such different channel effects. As previously discussed, applicants' system and method utilizes cell-specific pilot subcarriers to characterize a channel from the base station within a cell, but also common pilot subcarriers to characterize the aggregate channel from other base stations in surrounding cells. Nowhere does Korpela discuss characterizing both intra-cell and inter-cell channels. As a result, Korpela fails to teach or suggest the claimed elements as indicated by the Office Action.

Applicants further submit that one would not have been motivated to combine Ma with Korpela to arrive at applicants' system because Ma teaches its techniques in an unsynchronized communication network. (See, e.g., Ma, Abstract.) In applicants' system, common pilot subcarriers from different base stations are transmitted in alignment of frequency subcarrier index so that mobile stations can estimate the composite channel coefficients for recovering common information data carried by the common data subcarriers. Such a technique would fail if applied in the unsynchronized system of Ma, since signals in an unsynchronized system are not assured of being detected by the mobile stations in an aggregate fashion. One skilled in the art would therefore not look to combine Ma and Korpela to arrive at applicants' invention.

For at least these reasons, Ma and Korpela, alone or in combination, fail to teach or suggest the elements of the independent claims. Applicants submit that independent claims 1, 31, 41, 49, and 50 are therefore patentable over the cited references. Dependent claims 2-9, 11, 32-40, and 42-48, provide additional patentable distinctions over the cited references, such as, but not limited to, additional characteristics of the

common pilot subcarriers and cell-specific pilot subcarriers. Accordingly, applicants respectfully request withdrawal of the rejection of the claims.

D. New Claims

Independent claim 1 is directed to base stations and mobile stations in a wireless communication network. The newly-added claims are directed to the individual network components rather than the overall network. Namely, independent claim 31 is directed to a method in a base station and independent claim 49 to a base station. Independent claim 41 is directed to a method in a mobile station and independent claim 50 to a mobile station. Independent claims 31, 41, 49 and 50 each contain the four types of subcarriers contained in claim 1, namely cell-specific pilot subcarriers and cell-specific data subcarriers, as well as common pilot subcarriers and common data subcarriers. Support for such claims is therefore provided by the same disclosure as supports independent claim 1.

E. Conclusion

In view of the prior amendments and remarks, applicants believe the pending application is in condition for allowance. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (206) 359-3129.

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, the applicants are not conceding that previously pending claims are not patentable over the cited references; instead, any alteration or characterizations are being made to facilitate expeditious prosecution of this application. The applicants reserve the right to later pursue any previously pending or other broader or narrow claims that capture any subject matter supported by the present disclosure, including subject matter that might be found disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any

parent, child or related prosecution history shall not reasonably infer that the applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any deficiencies, or credit any overpayments, to our Deposit Account No. 50-0665, under Order No. 612408001US1 from which the undersigned is authorized to draw.

Dated:

4/27/11

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